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WONG, XAVIER S				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/630,494

Applicant(s)

KUMAR, SAURABH

Examiner

Xavier Szewai Wong

Art Unit

2462

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12.02.2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-11, 13-31 and 33-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-10, 11, 13, 14, 16-18, 20-31 and 33-35 is/are rejected.
- 7) ☒ Claim(s) 15 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-5, 7-11, 13-31 and 33-35 are pending

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1- 6, 9, 10, 11, 13, 14, 17, 18, 20, 21, 22, 24-29 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mankude et al (US 6795866 B1, Mankude) in view of Egevang (US 2003/0081605 A1) and in further view of Basso et al (US 7065086 B2, Basso).

Claims 1, 9, 11, 13, 17, 20, 28, 32, 33, 34 and 35: Mankude shows an apparatus (e.g. switch – fig. 2 server node for multiplexing) comprising an article of manufacture comprising computer-readable medium having instructions stored thereon executable by a processor to handle packet fragments, the apparatus handles the packet fragments by:

- i. an entry point and network device (fig. 2 items 221, 218 & 230) for determining if a fragment of a packet is either a head fragment or a non-head fragment (col. 7 lines 10-12);
- ii. processing the fragment if it is determined to be said head fragment to determine a destination address for said head fragment (col. 7 lines 17-20), wherein the means is a packet fragment forwarding mechanism 230;
- iii. using the determined destination address to any corresponding non-head fragment of said packet that is received subsequently after the head fragment and to

any corresponding stored non-head fragment of the packet that is received prior to the head fragment (col. 7 lines 24-31);

wherein step iii. above comprising further steps of:

iv. holder object means for generating a session associated with the head fragment (col. 7 lines 20-22: destination address *entry* initialization by a holder object; see also col. 6 lines 28-36) said generated session being a period of time to store forwarding information for the packet or a fragment thereof (col. 7 lines 13-16: system links the fragment into the holder object (store) associated with the packet so that the fragment can be sent to the destination node at a *later time* – therefore, a period for store forwarding info exists) and holder means for obtaining the destination address from the session, and applying the determined destination address to any corresponding non-head fragment of said packet that is received subsequently after the head fragment includes *using* the destination address obtained from said session to said any corresponding non-head fragment received subsequently after the head fragment (col. 7 lines 24-31); and,

v. a storage unit (fig. 4) coupled in the network device for storing a plurality of corresponding non-head fragments if the session has not been generated (col. 6 lines 37-42: “non-first” fragments stored in queues).

Mankude further discloses applying the determined destination address to the non-head fragments includes overwriting (modifying) a destination field of these non-head fragments with the determined destination address (col. 5 lines 57-63: a *unique value*, based on the header, is “*copied*” into each (non-head) fragment to identify which packet the (non-head) fragment belongs to, and thus, to which destination according to the header).

Yet, Mankude does not very particularly mention:

"an exit point coupled to the network device to update non-head fragments."

Egevang discloses a communication module (exit point) applies (modifies) the destination address based on the NAT process which is determined by the first packet fragment destination address ([0048] lines 1-3 & 7-11). It would have been obvious to one of ordinary skill in the art at the time the invention was created to implement an exit point coupled to the network device to update non-head fragments as taught by Egevang to the fragment processing means to use destination address to corresponding stored fragments after the session has been generated as taught by Mankude to reduce latency for transmitting data across a network ([0001] of Egevang).

Yet, Mankude, in combination with Egevang, do not very specifically mentioned of "forwarding said head fragment to said determined destination address," "non-head fragment of said packet that was stored prior to receiving said head fragment and to at least one non-head fragment of said packet that is received after said forwarding said head fragment" and "adapted to process according to at least one of layer 4 through layer 7 criteria."

Basso teaches forwarding said head fragment to said determined destination address (col. 10 lines 1-5: first fragment contains relevant content-based info – destination address – is forwarded to its destination); applying said destination address to non-head fragment of said packet that was stored prior to receiving said head fragment and to at least one non-head fragment of said packet that is received after said forwarding said head fragment (col. 11 lines 5-12: all fragments received prior to the first fragment... forwarded to their destinations; col. 12 lines 11-20: fragments that are not the first or last fragment are

stored in PCCB queue until the first fragment is received since it contains *content-based routing information – destination address* applied; col. 16 lines 43-47: destination ID applied to fragments and forwarded) and switch is adapted to process according to at least one of layer 4 through layer 7 criteria (*abstract: layers 3-7*). It would have been obvious to one of ordinary skill in the art when the invention was created to implement the steps of Basso to the fragment forwarding system of Mankude, in combination with Egevang, to avoid time-and-resource consuming storing of fragments as “fast forwarding” is applied (Basso: col. 5 line 65- col. 6 line 9).

Claim 2, applied to claim 1: Mankude teaches processing the head fragment includes generating a session pointer data structure having the destination address (fig. 4: 412, 422, 432; 416, 426, 436), the method further comprising after processing the head fragment:

i. locating said destination address from the session pointer data structure that was generated during the processing of the head fragment (col. 6 lines 37-44).

Yet, the applying of said destination address to said at least one corresponding non-head fragment includes applying the destination address located from said session *pointer* data structure to a corresponding non-head fragment subsequently received after receiving said head fragment.

Egevang discloses a router means comprising a packet fragmentation manager (PFM) comprising a collection module receives packet fragments ([0045] lines 1-5) and then following receiving a first packet fragment (header), a translation module will

translate destination address to subsequent packet fragments based on the first packet fragment destination address and network address translation NAT process ([0047]).

The translation and modifying steps may read on as *applying the determined destination address* to the non-head packet fragments.

It would have been obvious to one of ordinary skill in the art at the time the invention was created to modifying the pointer of Mankude to include a step of applying a destination address to a fragment as Egevang applies a destination address to the fragments as a known option in the same field of endeavor to realize the benefit of improving efficiency in packet fragmentation and forwarding by using pointers rather than consuming ample memory (array) space.

Claim 3, applied to claim 1: Mankude mentions the packets as IP packets (col. 5 lines 57-63), therefore, the fragments are IP-fragments.

Claim 4, applied to claim 1: Mankude discloses the first (head) fragment includes all header information (col. 6 lines 6-8) from the packet, and wherein the at least one non-head fragment includes packet data from the packet (col. 6 lines 4-6).

Claim 5, applied to claim 1: Mankude discloses processing head fragment includes processing one of the fragments having the header information (col. 7 lines 10-12). Yet, Mankude may not have specifically mentioned duplicative header information from the packet wherein the step of applying (destination address) includes designating another one of the fragments having the header information as the at least one non-head fragment. Egevang discloses that each packet fragment (e.g. meaning head & non-

head fragments as well) may include a packet fragment header wherein a "more bit" flag (in both head and non-head fragments) indicate if there are more fragments to be processed ([0038]); which means that the "more bit" flag is interpreted as header information designated to another non-head fragment, wherein the non-head fragment later is applied a destination address thereof ([0045-48]). It would have been obvious to one of ordinary skill in the art at the time the invention was created to realize the benefit of having header information in non-head fragments as taught by Egevang to the fragment processing of Mankude since fragments may not be processed in order and by having header information the fragment processing manager may know where the fragments belong to.

Claims 10, 14 and 18, applied to claims 9, 13 and 17: Egevang discloses forwarding the non-head fragments having the determined destination address applied thereto ([0048]).

Claims 21 and 29, applied to claims 20 and 28: Egevang shows in fig. 1 a router 110 comprising packet fragmentation manager (PFM) may be interpreted as a switch network device ([0045]).

Claim 22, applied to claim 20: Egevang discloses a collection module 402 (entry point) and a communication module 408 (exit point) comprise software-based function ([0044] lines 11-13; [0048] lines 7-11).

Claim 24, applied to claim 20: Egevang discloses the network device processes the head fragment to determine the destination address ([0044-45]).

Claim 25, applied to claim 20: Egevang discloses a translation module 406 (another network device) the communication module 408 (exit point) to perform head fragment processing ([0047] lines 1-9).

Claim 26, applied to claim 20: Egevang discloses a translation module 406 (another storage unit) coupled to the communication module 408 (exit point) to store destination address ([0047]: NAT process obviously needs address storage).

Claim 27, applied to claim 20: Egevang discloses the router (network device) has software program to handle fragments ([0033]).

Claims 7, 16 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mankude et al (US 6795866 B1, Mankude) in view of Egevang (US 2003/0081605 A1) and Basso et al (US 7065086 B2, Basso), applied to claims 1, 20 and 28, and in further view of Iny (US 2002/0061030 A1).

Claims 7, 16 and 30, applied to claims 1, 20 and 28: Mankude, modified by Egevang and Basso, disclose the claimed invention yet do not specifically mention addition of a routing tag to non-head fragments that includes the determined destination address. Iny mentions fragments being tagged with destination ID ([0020]) before the fragments are sent to their destinations. It would have been obvious to implement the step of tagging a destination address to a fragment as taught by Iny to the fragment forwarding process of Mankude, modified by Egevang, so that the fragments may be forwarded to a reachable destination while maintaining load balance.

Claims 8, 23 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mankude et al (US 6795866 B1, Mankude) in view of Egevang (US 2003/0081605 A1) and Basso et al (US 7065086 B2, Basso), applied to claims 1, 20 and 28, and in further view of Malagrino et al (US 6714985 B1, Malagrino).

Claims 8, 23 and 31, applied to claims 1, 20 and 28: Mankude, in combination with Egevang and Basso, disclose the claimed invention yet may not have specifically mentioned the head fragment is processed according to at least one of layer 4 to layer 7 criteria. Malagrino discloses that non-last (e.g. including head) fragments are processed through higher layer (layers 4-7) operations (col. 4 lines 27-42). It would have been obvious to one of ordinary skill in the art at the time the invention was created to forward the head (or non-last) fragments for higher layers processing as taught by Malagrino and apply such process to the fragmentation manager of Mankude, in combination with Egevang, to avoid inefficient use of memory due to the varying number of fragments at a switch and make it easier for hackers to obtain packet info (col. 3 lines 10-26 of Malagrino).

Allowable Subject Matter

Claims 15 and 19 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims; claim 9 and claim 11 would be allowable if combined.

Response to Arguments

Applicant's arguments with respect to claims 1, 13, 17, 20, 28, 33 and 34 have been considered but are not persuasive. Applicant argues neither Mankude, Egevang nor Basso suggest "a routing tag that includes destination address" (remarks pg. 14) (similarly argued on pgs. 15-17). Mankude mentions "applying the determined destination address (therefore, acting as a routing tag) to the non-head fragments includes overwriting a destination field of these non-head fragments with the determined destination address." The examiner suggests that Mankude does read on the above since a *unique value*, based on the header, is *copied* into those non-head fragments so that the non-head fragments can be linked eventually to the destination where the header will be, col. 5 lines 56-63. Such "copying" of the unique value, which leads to the header destination, is deemed to be an action of overwriting (or being read as tagging) destination fields in the non-head fragments since originally the non-head fragments are held by holder objects by the non-head fragments prior to knowing their destination node (e.g. destination originally unknown to the non-head fragments), col. 6 lines 40-44: upon... determining the destination node, the system forwards the queued packet fragments to the destination node.

Conclusion

This action is made FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xavier Wong whose telephone number is 571.270.1780. The examiner can normally be reached on Monday through Friday 8:30 am - 6:00 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571.272.3174. The fax phone number for the organization where this application or proceeding is assigned is 571.273.8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866.217.9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571.272.1000.

Application/Control Number: 10/630,494
Art Unit: 2462

Page 12

/Xavier Szewai Wong/
x.s.w
15th February 2010

/Donald L Mills/
Primary Examiner, Art Unit 2462